



Side-Stepping the Labyrinth - Part II: Choosing the Best EAI Scenario Solution for SAP® NetWeaver™

By Axel Angeli and Lynton Grice

Editor's Note: Our readers who attended Axel Angeli's presentation at the SearchSAP.com conference in Chicago recently may have gotten a sneak peak at this white paper already. For readers seeing this 48-page white paper for the first time, you will find it thoughtful, provocative, and comprehensive. As with Part I of this discussion, this paper is co-authored by Axel Angeli (in Germany) and Lynton Grice (in South Africa). Their virtual international collaboration is made possible by numerous integrated entities from their local PCs to cables, routers, servers, and satellites, resting finally on our server in beautiful Colorado, awaiting your download. In this extensive paper, Axel and Lynton finalize their discussion of EAI options for SAP NetWeaver. They evaluate and discuss the pros and cons of the larger "high-end" products as well as many of the smaller, more obscure packages on today's market, and step forward with their personal recommendation. We won't give the winner away here, you'll want to read the paper for yourself and understand how they reached their decision. Be sure to download and print the paper, as you'll surely want to use it for later reference or for making a case with management as you implement your EAI initiatives.

This is a special version of this white paper provided to Seeburger by SAPtips. If you would like to view the article in its entirety, you can view it online if you are a subscriber to SAPtips (www.SAPtips.com).

*To be, or not to be, that is the question:
Whether 'tis nobler in the mind, to suffer
The slings and arrows of outrageous fortune
Or to take arms against a sea of troubles
And by opposing end them.
Hamlet, William Shakespeare*

Making the transition to a service-oriented architecture (SOA) will be a decision that will transform the way that your company does business. It will be a transition for the better, of course, but also a decision whose impact will be felt for a decade, if not even for the century. Therefore, deciding for or against a special product or vendor won't just be like buying a piece of software, it will be a decision of no return! Many aspects need to be considered; not only technical ones, but also questions of strategy, trust, persistence, and general politics. We wrote this article series in order to bring these themes together. Sometimes, SOA may feel like a deal with the devil, promising the world and delivering uncertain value. To do SOA right, you'll have to set aside the easy approach of "in one vendor we trust" and gather the know-how to forge your own path. As we will show, SAP is certainly worthy of being the primary vendor in an SOA, but your SOA destiny is always in your own hands.

1 Introduction

Part I in this series examined where application integration is today, and how Web services (and their accompanying standards and technologies) are molding the way in which complex integration scenarios will be formulated in the future. Following on from this, Part II will now revisit the focal point on how one should go about selecting the best EAI scenario solution for SAP NetWeaver. Practical questions and critical aspects to consider when evaluating an EAI solution will be highlighted, and this will provide readers with enough knowledge to be able to confidently separate the empty claims from a true EAI solution that will take them confidently into the future.



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ultimately in XML, while an indispensable requirement for a message queue is to be able to collect and bunker data before it does any processing steps.

2.3.3 Business Integrators (Workflow Engines)

A great message queue is unfortunately a dumb piece of software, and as such is dependent on software that actually consolidates and processes the messages.

There are definitely more than 100 business integration engines out there. There are the sharks and the small niche providers. Interestingly enough, hardly any of the integrators deliver a complete set of the most commonly used design patterns when using their workflow tool. In practice, this means that every customer has to code (and test, correct, and enhance) the same algorithms over and over again. When all the integration engines finally comply with the BPEL standard, there is hope that someone will bring out a toolbox that solves the most common problems. These include: the multiple redundant messages in a queue, content-based serialization, and simply appropriate adapters.

- **A Market for Team Players: Seeburger**

The big players in this market are Mercator, TIBCO, and SeeBeyond; none of which are outstanding. One product worth mentioning is the approach done by Seeburger². They have actually come out of the EDI business and have standardized their EDI message adapter and monitoring engine into a fully featured BPEL compliant business integrator. What makes Seeburger an interesting choice is the feature rich business-monitoring dashboard, and its strategic partnership with SAP. Furthermore, Seeburger is the SAP endorsed supplier of EDI adapters for NetWeaver and XI. Although furnished with a standard J2EE engine, Seeburger plugs transparently into SAP XI and is capable of running on the SAP WebAS J2EE engine as well. Currently, you won't really see a benefit out of this, but if your company decides on SAP NetWeaver for strategic reasons, then you would need to consider a feature rich and tested adapter suite (mainly, but not exclusively for EDI). Secondly, when SAP releases its "unbreakable Java", Seeburger will immediately make use of the new robustness. Interestingly enough, this may lead to a situation in which Seeburger will be an argument to establish XI; because it establishes such a great symbiosis.

- **IBM Puts Stakes on Wizards**

IBM offers WebSphere Business Integrator software. This is a classical workflow and adapter tool that allows picking messages from a wide variety of formats and data sources, normalizes them, and hands them over to a processor. This all is accompanied by a standard toolset for handshaking, monitoring, logging, and error handling. IBM always stresses that its goal is to deliver model-driven development tools that allow a functional consultant to draw up business processes that automatically compile into appropriate workflow code (be that BPEL or anything else that suits the need).

- **BIZTALK Goes WYSIWYG**

It comes as no surprise that Microsoft BIZTALK follows the visual design approach. The design tools provided on BIZTALK are certainly among the most elaborate, with its familiar touch of Windows and Visual Studio. If you allow your organization to rely on Windows and i386 technology for the next decade, BIZTALK is a most serious choice.

² SEEBURGER is another long-time associate of SAP. They had been, for a long time, the only EDI converter tool that concentrated on being an EDI interface provider for use with R/2. SEEBURGER is now an official provider for EDI solutions along with SAP XI (<http://www.seeburger.com>)



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- **SAP XI Has Still a Long Way to Go**

SAP XI may be a future challenger; but currently it is only something for pure SAP shops. It is still in evolution so it can be recommended for smaller experimental applications but not for any mission critical ones. The endless list of notes and bug fixes on installation of XI makes administrators swear day and night. We currently feel like we are back in the early days of Windows when we spent more time on installing and fixing the software than using it productively. The visual design tools are not really what you would call “state of the art” and developing a cunning process monitoring dashboard would certainly be a fertile area for a third-party development. A strong point for XI would have certainly been if it ran exclusively on top of the robust ABAP engine, instead of the current J2EE engine. Then you could benefit from the established maintenance and development experience of ABAP and R/3. The situation will be different if SAP bring XI together with the future “Unbreakable Java” J2EE engine, which will introduce managed processes as an indispensable prerequisite for running a workflow engine in a business critical environment.

2.3.4 People Integration

- **SharePoint: Portals and Slightly More**

When it comes to people integration, there is hardly anything to beat Microsoft’s offer. You may either like Windows or not, but it’s a fact that it is a standard in most offices, and the end-users won’t really follow expert disputes about GUI designs and whether Linux or Windows has a better offer. They all know Windows, and software that looks like Windows is most welcome.

- **Windows Is the True Portal**

There are many collaboration tools, no wonder, with all the abundance of Windows software available. Microsoft itself offers its SharePoint software (that originally was designed as a Web-based collaboration system). When the Portal hype started all over, Microsoft quickly reinvented SharePoint as “SharePoint portal server”, with the result that it is now the most sophisticated and feature-rich portal software out there. When you look a little closer at SharePoint, and Windows in general, you would ask yourself if a Windows GUI for portal content would not be the most appropriate, and by far, cheaper and convenient solution, when used for intranets only.

- **IBM Complies to Open Standard**

IBM WebSphere has its own portal server, unspectacularly named: WebSphere Portal. WebSphere Portal is a strict follower of the open portal standard RFC. This allows plugging in portal components designed for any other portal that abides by this recommendation.

- **SAP Enterprise Portal**

You would probably not choose SAP EP if you do not run SAP NetWeaver for other purposes already. EP has its strengths only if the majority of portal content is information-backed, in one or another, by SAP R/3, SAP BW, and the like.

If you are to choose a portal solution that has predominately non-SAP content, then it would be wiser to discuss whether to stick to a fully open standard solution like WebSphere portal, or developer friendly approaches like SharePoint. Other vendors, like Oracle, may have an appeal if you already have a relationship with the individual supplier. Generally the decision for a portal solution could be based on the already existent server landscape, so let your administrators and developers fight over what makes the most sense.



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2.3.5 Business Content and Information Integration

The strength of the new Enterprise Services Architecture is the full freedom of choosing the best solution for an individual niche. If you run R/3, you do not necessarily have to use SAP BW as your data discovery tool. If you like how SAP BW does the job, go for it, at least in runs on ABAP, which is a great advantage if you plan to develop your own special data evaluation tools. If you are more interested in scientifically supported time-series analysis and prognosis, you might consider the (SAS) Statistical Analysis System (<http://www.sas.com/>) tool that also delivers a neat SAP bridge, and in addition, has highly professional graphics and any kind of statistical analysis that science currently endorses. For an SEM solution, you might also want to have a look, specifically in the Windows market where a larger number of specialty and niche vendors deliver simulation software that targets the needs of individual interests and industries. As far as a general business intelligence tool goes, we very much liked the Windows-based BOARD M.I.T. from Swiss company Orenburg (<http://www.board.com/>).

IBM plays a different card: their strategy is based mainly on third-party vendors. It is a declared work sharing: IBM delivers the engines and working framework, while others produce the software. This strategy is mainly headed towards SMEs, and is convincing because the smaller vendors have a good appreciation of the business needs, while being in need of a strong, reliable development framework.

.NET is the Windows world, so you can choose from several thousand ERP solutions all over the world. Microsoft itself claimed its share but apparently could not decide which one would suit it best. They have three big ERP solutions in their portfolio: the old fashioned Great Plains, the modern Navision for small and mid-sized enterprises, and AXAPTA, that targets the high-end market. None of them are genuinely developed for, or on top of .NET.

A player that still needs to be observed is Oracle. It is yet unclear what Oracle wants to do with its acquisition of JD Edwards and PeopleSoft other than trying to weaken the market position of SAP. The fact is that, currently, the uncertainty within present PeopleSoft sites is high, and the number of specialists that position themselves as “PeopleSoft to SAP migration experts” is on the rise.

2.3.6 Business Process Integration

IBM is definitely the technology leader in the area of ESA, if you regard it from a scientific point of view. They attack the field with pure technology. IBM is one of the protagonists of the Enterprise Service Bus, and if you ever wanted to know more about the technical background of it, you would need to start digging into the abundance of material found at IBM “developerWorks” or dive into their “Redbooks” (<http://www.redbooks.ibm.com>).

- **SAP Is the Shooting Star**

SAP is the clear challenger with its Exchange Infrastructure. Although it took SAP until the SAPHIRE Copenhagen, and Boston 2005 conferences to finally commit themselves to the ESA paradigm, they already have a strong positioning in the market. The current releases of XI are certainly over-estimated when compared to what other middleware products have to offer. On the other hand, SAP seems to be the only performer in the circus that can honestly provide a full, big enterprise with all their own products. This said, it is intriguing to use NetWeaver XI as the middleware and technical ESA layer, despite its current deficiencies. Time evidently plays in favor of SAP. Transforming the enterprise to ESA will take time, time that will help SAP to make XI mature enough to be competitive with the leaders in this area. Though, we are still tempted to claim: if XI were a pure ABAP product, they would have achieved this already.



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- **Microsoft Excels Through Windows**

An interesting product to look at is BIZTALK, with its wealth of features and almost certainly the most mature (and easy to use) design interface. The difficulty with BIZTALK is that it requires Windows, and hence, also the accompanying hardware restrictions. If one has a general look at Microsoft, then one has to admit that the Windows landscape is already a very good ESA infrastructure, based on the DCOM (and now .NET), distributed application framework. They are also very quick learners when it comes to standards, so BPEL and WSDL were quickly adopted by Microsoft in the respective products. While others were fighting about the right standard, Microsoft implemented what they thought would be required, and hence set the standards through pure facts. HTML and more on point, Javascript, are now defined by the capabilities and DHTML support of Internet Explorer rather than the W3C body. If you use XML, then the first reference is the Microsoft "msxml3.dll", which is part of every Windows installation. Therefore, whether you like it or not: if an application does not run through Internet Explorer, you cannot sell it to the masses. Period!

- **Big Specialized Vendors are Still Dominant**

Currently it is not necessarily a fact that IBM, SAP, and Microsoft are truly dominating the market. There are other big names in this area like Mercator, TIBCO, IONA, SeeBeyond, etc. They are all great products and have proven their value in many cases, but unfortunately some of them give the impression today that they would rather invest in marketing than in technology and education.

- **The Hour of the Smaller Vendors**

We are all blinded by the light shining from the big players, but we can now take off our sunglasses and see what else the market has to offer. There are numerous other vendors providing Business Integration middleware and many of these products have much more to offer. This comes as no surprise, as most of these vendors come from the pragmatic edge, and developed their products not with marketing considerations in mind, but because they needed something to solve a specific problem. We encounter the same situation when we look at software revolving around CRM or Business Warehouse capabilities. Here, most of the average PC products you can buy deliver far more useful features, and higher performance, than the big vendors will ever be able to offer. Unfortunately they seldom have a faint idea of how to roll-in their software to corporate headquarters and onto the clerk's desk. After our test, we decided for technological reasons, that Seeburger BIS best suits our needs, because it plays so well with NetWeaver, and has strong EDI capabilities. But you cannot use this as a "generalized" decision for all companies. Nevertheless, take a closer look at some of the smaller vendors out there; they may just offer you exactly what you are looking for.

- **Fiorano Muscling In...**

One vendor that has potential as a new challenger in the market (and that we, unfortunately, did not evaluate) is Fiorano³. Their "Business Integration Suite" of products shows awesome SOA and "event-driven architecture"(EDA) support, and they provide an equally impressive "Business Component Architecture"(BCA) framework. Added to this, Fiorano has shown very impressive test and performance results when compared to other products like Tibco and IBM WebSphereMQ. The runtime deployment infrastructure, and associated integration and modeling

³ Fiorano is a leading provider of Enterprise class business process integration and messaging infrastructure technology. Companies use Fiorano products to develop Real-Time Enterprise competencies, improving operational efficiencies and business performance by easily deploying flexible business processes spanning multiple applications, platforms, and partners.

(<http://www.fiorano.com>)



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tools provided by them, looks highly impressive, and this could easily be another “smaller” vendor that you should keep your eye on!

2.3.7 Development Framework

IBM WebSphere applications run on top of the IBM WebSphere Application Server (WAS), which is a container-based J2EE framework. The descriptive attribute of IBM WAS is its stability and robustness under stress and extreme operating conditions. The primary programming language is Java. Process isolation application flaws may only bring down their own process, and do not affect any other processes in the runtime environment. IBM is the original contributor of the Eclipse framework, and Eclipse can be used to develop for WAS.

- **Development Framework**

Microsoft's .NET framework is an immediate extension to the Windows operating system. Without simplifying too much, one can say that .NET and Windows are the same. The core of .NET is the common language runtime, a set of sophisticated libraries, and a pseudo “just in time” compiler that translates the Microsoft Intermediate Language (MSIL) into native code.

Microsoft provides its own development environment, the Microsoft Visual Studio. There are, however, other IDEs available (e.g., the open source Borland Delphi is also capable of producing .NET compliant code). A remarkable point is the big choice of programming languages. There is the modern C++ derivative C# (pronounced C sharp), a new fully object-oriented version of Visual Basic (which actually looks more like Modula-2), and Microsoft's Java dialect: J#.

The choice of components that can be used with .NET is absolutely endless, and it furthermore allows using any registered “COM” component from the underlying Windows installation. This contributes to a higher productivity and quality level in application development by simple reuse of software components.

- **ABAP Is Unbeaten**

The true strength of NetWeaver is its ABAP development and runtime environment (and, of course, the full featured and unmatched ERP suite).

3 Test Drive and Examine Your Candidates

Going away from the business politics, we find ourselves in a crucial decision-making position where we need to look at the technical considerations for choosing an EAI solution. EAI will quickly become the central nerve center of your IT systems. It will be something like the central highway, conducting the traffic from and to the central business areas. If it fails, or your message handling pipes get congested, then all of your business alongside the highway will suffer. As a consequence, EAI should be able to prove its worth on the “battlefield”, and should be put through some stringent test scenarios. You want to bombard the solution with everything you have, to ensure it will survive the toughest of days in the production environment. Because an EAI software solution has so many facets and intricacies to it, you will need to sit down and carefully decide on what specific, crucial areas you want to tackle—more specifically you need to decide:

- **WHAT** are you going to test? For example, you may decide that you want to see how well the EAI solution works if it gets 10,000 messages dumped onto it at any one time. This is not always just to test the EAI solution, but also how well it interacts with other software products, like SAP, under such a stressful situation.



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- WHY are you going to test? You may speculate that the likelihood of a huge number of messages coming into the system at one time is very high, and you need to ensure that the solution can handle the extra stress without creating a negative effect on business.
- HOW are you going to test? This is debatable and will be specific to the situation at hand, but would typically entail setting up a “lab type environment” whereby simple, stressful scenarios can be easily set up, and results evaluated.
- WHEN are you going to test? You may be tempted to say you’ll test it before you buy it. But there are other decisions to make. Do you test before you install the applications you want to plug in? Do you first decide on EAI standards? And more important, will you do a test drive, or will you buy the software based upon the impression of a presentation, and then start the bullet test?
- WHO is going to test? It needn’t necessarily be you who actually performs the tests. It can also be the vendor’s obligation to deliver accurate and reliable test results. Normally, it should be sufficient to demand a vendor certificate for the results you request.

Further along in the article we will discuss how to go about “defining an investigation pattern”, to show how you would test the EAI product from all angles.

3.1 Criteria for Evaluating an EAI Solution

It is not just about pricing. Actually the packages offered are so different, that they cannot honestly be compared with each other, except with respect to price and value. There may be some packages that simply fall out of your budget, regardless of the great features they have, just as a Mercedes would normally fall out of your budget when deciding for a new family car. Nevertheless, an EAI solution’s performance, implementation speed, and scalability are crucial to any long-term integration strategy. Furthermore, a vendor’s viability and strategic alliances can be pivotal in deciding on one solution over another. In the end, the chosen solution should increase operational efficiency, lower costs, and provide the business with an agile platform with which they can move forward confidently.

There are so many things that an EAI solution needs to support, from basic “message brokering” functionality, to mapping to adapter support, to even things like the RFID and AS2 support. It will all depend on your individual needs, but, in the end, there will always be a few pieces of functionality that are required in any solution. The following takes a look at what “bare essentials” you need to look for when evaluating both the EAI solution and providing software vendor.

From a technical perspective, the solution should be built on top of an “open standard framework” that satisfies the following basic requirements.

3.1.1 Basic Requirements of an EAI Solution

- **Queuing**

A queue is a programmable space that receives and buffers messages for further processing. A proper queue must be capable of accepting, storing, and sorting any message it receives. This is usually handled by creating instances of queues that collect the messages they take care of. There must be a “dead letter queue” that collects all undeliverable messages. A message sent to a queue must never be rejected.



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- **Message Transformation and Formatting**

The best-liked area of most EAI tools is that of writing transformations. There should be simple table maps along with the ability to plug in programmed conversions. Clever EAI tools can automatically guess a likely mapping that only needs to be adjusted by the queue designer.

- **Message Routing**

In EAI it would be the exceptional case that the creator of a message would know the address of the recipient. It should rather be that the queue can determine the receiver from the “message context”, like message type, syntax of the message block, and special tags in the content. The SAP IDoc setup is an example of how the routing problem is solved impractically. When you send an IDoc, you have to specify the receiver with the IDoc header record provided, although the receiver is usually coded somewhere in the context as customer or vendor number (or similar). Good tools look into the document to determine the receiver.

- **Queue Consolidation**

This is still a seldom-found feature. There are many abstract activities that need to be performed on a queue that still have to be programmed by everyone individually. Problems are messages that are received redundantly like a message received from a Web site where the user clicks several times on the submit button (“nervous finger syndrome”) or messages are received from different sources with contentious content, e.g., a material master record where one message changes the price and another one the texts.

- **Easy Partner/System Configuration and Connection**

A quick and intuitive tool is what an administrator wants. They have no time to read endless documentation, and they would not want to set the same partner port for 250 vendors, that need to receive purchase orders via EDI.

- **Business Process Management**

This goes into the area of workflow. The queue handler should be able to trigger appropriate further actions from “hints” found in the message. It also needs to track the successful execution of the following steps, and eventually alert an interested party if something happens that is worth mentioning.

- **Monitoring and Exception Handling**

This is one of the weaker points of most EAI tools. While they can easily monitor their own information and messages; a dashboard that monitors many heterogeneous and hybrid applications plugged into your EAI is often much more difficult.

The problem is that almost all good EAI products provide this sort of basic functionality in their products to a certain degree. So what separates one product from another?

One thing that immediately comes to mind is the ability of the software solution to provide “standard maps” to make the mapping of complex messages easier and less time consuming. You’ll be very surprised how few EAI vendors actually provide this sort of functionality in their products to support a company’s “vertical industry needs”. That’s one of the problems with some of the big vendors out there, as they have plenty of support for the latest and greatest technologies and standards, but don’t provide the “niche” functionality that’s often required. Besides this, you could also carefully analyze how the algorithms and underlying technical architecture of the solution actually work, and then compare this to other similar solutions. Benchmark tests and associated results can come in handy here.



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3.1.2 Analyzing the Vendor

- **General Reputation of a Vendor**

You will, however, also need to turn your attention directly to the vendors themselves, and see exactly how they are perceived in the market. A great indicator of this is to take a look at the Gartner “Magic Quadrant for Application Integration Suites”. This will give you a good indication of the vendor’s market presence and their product’s efficacy. This report quickly sums up who the market “challengers”, “niche players”, “visionaries” and “leaders” are. This is not to say that the “market leaders” are necessarily the ones you need to focus on, in fact, often the smaller, more “niche” players are the ones to keep your eyes on!

Besides looking at the “Magic Quadrant” to get a good overview of the different vendors, you should also do a little of your own homework on the vendors to see how they shape up in the following areas:

- **Vendor Viability –**

How does the market perceive them? You want to see sufficient customer references, including implementations of large, successful, enterprise-scale, complex scenarios.

- **Vendor History –**

Look to where vendors have come from – if they’ve been in the integration market for a number of years, they’ve probably been involved in numerous integration projects, have hit their heads a few times, and have been able to use these experiences to restructure and redesign their product to provide you with a more solid offering. “Tried and tested” is always better than “new and hyped”!

- **Vendor Strategy with SAP –**

This is not generally a problem with the majority of EAI vendors out there, but it is nevertheless crucial that SAP sees the EAI vendor as a “strategic partner”.

- **Size of Vendor –**

This needs to be considered carefully. Small companies react quickly, big ones have more overhead. This overhead is welcome when you ask for many repeating actions, as it guarantees repeatability and compliance to standards. But a standard is often the smallest common denominator, so size can actually work against you when you require quick reaction times and specialty advice and support. Sometimes, when a vendor gets too large, their organizations start behaving like a big tanker ship. Reactions are lazy, and every action outside the normal plan requires enormous efforts and costs. They may very well appear as if they have got a very “arrogant” attitude, and you could find yourself locked into a lifetime of following “their rules”. On the other end of the scale, you don’t want a vendor that is too small, and is out of “geographic reach”.

- **Implementation Skills and Consulting –**

The vendor should have a proven track record with many successful, large-scale implementations. The vendor should furthermore be able to provide the right consulting expertise to ensure that your implementation can be as smooth and painless as possible. Perhaps the vendor can also provide you with a document that walks you through the major phases of the implementation. Does the vendor provide remote consulting expertise? This typically revolves around providing special, short-term consulting to troubleshoot problems over the Web or telephone. We need less talk on integration and more about implementing integration solutions!



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- **Speed of Implementation –**

Implementing a new integration package is never easy, and depends heavily on how quickly you can get it up and running, how much of the business is impacted, and what value the solution will provide. A company can gain quick advantages in the market by selecting a vendor whose solution can be implemented quickly, and that provides great strategic value. The speed of implementation should be one of the core features you look for when analyzing a vendor.

- **Service, support and training –**

The vendor should provide you with the flexibility, training, and support you require to ensure that your everyday operations can run as smoothly as possible (without breaking the bank!) Furthermore, do they provide training in EAI technology and EAI best practices? Are you able to leverage your existing resources and skills?

- **Single B2B and EAI Solutions –**

Many application integration vendors out there (be it moving from the EAI space to the B2B space, or visa versa) are becoming increasingly aware that their products need to support BOTH strong EAI and B2B application integration. Let's face it, EAI is no longer confined within the walls of an enterprise, and it is becoming increasingly important for integration products out there to provide the necessary tools, templates, and mappings to make trading partner integration as easy as possible. Questions you should ask yourself include:

- Does the EAI solution require you to purchase the entire vendor product suite?
- Does the vendor own the EAI solution, or have they merely repackaged someone else's product?

- **Single Vendor Strategy?**

This is by no means imperative, but you should “try” to use the same vendor for both your EAI and B2B requirements—it will just make things simpler in the long run. Some of the larger vendors like IBM, Microsoft, and Oracle provide great “generic” integration suites, but often require you to plug in other “adapter” products or modules just to get a simple B2B scenario working. This may not be the best option—you should be able to purchase ONE solution to cater to both your EAI and B2B requirements!

- **Scalable License Options –**

The vendor should be able to satisfy your infrastructure with the appropriate “flexible” and fair license scheme.

- **Cost –**

Obviously cost comes into play when deciding on an EAI solution. You should get a good feel what the “market perception” is on “how much a similar product would cost”, and then move forward from there. The vendor should be “open-minded” to hearing your case, and you should be able to negotiate in a fair and professional manner.

3.1.3 Features We Like to See in an EAI Solution

- **Mapping Tool –**

Your EAI solution should let you repeatedly leverage existing mappings. One challenge the product should overcome is the ability to easily map non-XML to XML data structures.



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- **Data Validation –**

The amount of time spent checking error messages sent from or received by your organization can become an absolute nightmare. The integration solution should be able to cleanse and continuously crosscheck the data to ensure it is correct and error free.

- **Development Environment –**

Performing a message mapping should, for example, be provided with a simple “drag and drop” mechanism.

- **Mainstream Integration Skills –**

Should the solution require programming, it should not entail learning a proprietary programming language, but should rather be based around the mainstream languages of J2EE and .NET.

- **Open, Standards-based Architecture –**

Does the EAI solution work on a variety of the most popular platforms, application servers, and databases? Can the solution work efficiently in your current client/server architecture? Is it flexible enough to allow you to have both JDBC and ODBC connections into numerous data stores? What about Web Service support?

- **Adapter Support –**

The EAI solution should support a large number of industry specific adapters that allow it to plug into another vendor’s product line.

- **Scalable –**

The solution should be able to scale according to your requirements.

- **Metadata Management –**

Any good EAI solution should allow for the easy setup and maintenance of metadata used in integration processes and scenarios.

- **Workflow Management –**

There should be a simple “drag and drop” environment in place that allows you to define quick workflow scenarios that can be tested in minutes.

- **Process Modeling –**

You are going to need a product that allows you to orchestrate the communication between certain systems and services in a seamless and easy to understand manner. A toolbox or palette should be provided within the development environment that provides you with the objects you require to whip up a BPEL process in no time. This is closely related to “workflow management”, above.

- **Business Email –**

Email integration is still one of the most widely used means of communicating today. Why not get a product that gives your smaller suppliers the option to use “business mail” to send and receive documents like Orders, Delivery Notes, Invoices, etc., to you via the simple email interface. Small suppliers can receive a pre-configured form via e-mail, and once it has been filled out, it can automatically be transformed into an XML document and seamlessly integrated into you backend system.



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- **Collaborative Design –**

EAI projects often span several countries and different time zones. The EAI solutions should have a suitable “check-in and check-out” facility that allows developers to work on the code they need to, and then be able to “resynchronize” with the central repository to update and get the latest source code version(s).

- **Business Dashboard –**

Business dashboards should provide users with key performance indicators (KPIs) that enable them to measure and improve the speed and effectiveness of organizational operations. The difference between dashboards and cockpits was mentioned in Part I of this series, but you can equate them to an airplane cockpit or the dashboard in your car. You are able to drive a car, or fly a plane without a dashboard, but doing so is both dangerous and error prone. This is also true for the enterprise; management needs to be made aware of exactly what is happening along the entire value chain at all times, or they may fall victim to what problems lurk around the next corner. This is, unfortunately, where most EAI solutions fail dismally. They typically provide great “technical monitoring” but fail to provide the “business process monitoring” needed to monitor a business process from end to end. This is what management is crying out for. This “business monitoring” may provide gauges, meters, flashing icons, etc., that give management the view that they need to be able to see exactly what is happening in the business, at any particular point.

- **Simulation –**

Many businesses have high volume, resource-intensive workflow processes that are not easy to test or debug. It is very useful to be able to easily simulate and test these scenarios to get an idea on how they will perform, before they are deployed. This will allow the systems analyst to determine what resources are needed to achieve the best performance, what bottlenecks are occurring (if any), and if there is any unproductive use of any other resources.

- **Message Filtering –**

Often, messages coming into an integration product are very complex, and need to be filtered before being forwarded onto the target system(s). Filtering analyzes incoming messages, and selectively leaves out certain content, etc., before passing it onto the integration server; or the message is simply sent onto the target system.

- **Intelligent Routing –**

Basic message routing is a “basic” requirement fundamental to any integration solution. Simply put, “routing” is the mechanism of moving information from one system to another. It is crucial that the solution is able to split information coming out of one system, and send it to multiple target systems. It must be able to “group” information coming from many systems, and send a consolidated message to a single target, and able to handle messages coming from many systems, that need to be sent to many other systems. Intelligent, or “content-based” routing builds on this, but on a more “dynamic” and “intelligent” level. When a message arrives in the integration server, it is first analyzed to determine what system it comes from. Once the source system and message schema are understood, the message is transformed (if required) and additional services and rules are applied. Once the message has been processed, the integration solution routes the message to the correct target system.

- **Business Events –**

Business events occur daily in a business. However, with the correct solution in place, they provide an actual opportunity to increase the speed and accuracy of business processes. By “speed” we mean manufacturing a car faster, or being able to deliver better customer service. In a typical business environment, a business event would be something like the arrival of a new



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shipment, employee address change, or a batch job failure. When a business event is raised, it should trigger the relevant business process, which could involve a combination of both automated (i.e., SMS, email, etc.) and human activities. The applications that will be developed in the next five years will better address business events than those developed in the previous 25 years.

- **Intelligent Workflow –**

Any alert or exception raised by the application should be escalated to different managers, based on the importance of each alert, and the role of each business user. This might also mean alerts via email, SMS, etc. Be sure your EAI solution caters to this—remember we want business transparency and seamless integration. Workflow is at the heart of this.

- **Flexible Adapters –**

Most EAI products these days have numerous adapters or modules that allow you to quickly and easily integrate into third-party software products and systems (like SAP, SQL Server, etc.). Most adapters these days are, however, somewhat “thin” in nature, meaning that they typically provide no enhanced functionality but provide only a simple “bridge” between communicating applications, and actually have a negative impact on performance. To make matters even worse, the majority of these adapters are proprietary in nature. The following shows where adapters are heading to – the “model-driven” approach.

- **Model Driven Architecture**

We are slowly but surely moving away from “thin”, highly customized adapters into a more “model-driven”, “richer” adapter. These enhanced adapters provide developers and architects with a pure abstract view of the configuration details needed to get the adapter working correctly. Because these adapters are “model-driven” very little code is required. The adapter allows users to get a nice, businesslike, graphical view of the process, without having to worry about the complex connection details in the background (and is therefore able to focus more on the business issues at hand). So you might have an abstraction for middleware services (like connecting to MQSeries), or another abstract layer that allows you to connect to a database like SQL Server. The adapter will encapsulate the complexities behind connecting and communicating with the application or data source and will just present users with a friendly, graphical view. With all the benefits these “richer” adapters can provide, it comes as no surprise that integration vendors are moving more and more towards them. However, this type of adapter requires a substantial amount of time and money to develop, and therefore some vendors are somewhat reluctant to take the plunge. There is no doubt that as integration becomes more sophisticated and challenging, enterprises are going to be looking for integration solutions that follow a “model-driven” development approach, require little or no programming, and give architects a “minimalistic” view of the enterprise. Therefore, be sure the EAI product supports these “richer” adapters, or at least has a strategy or partnership that supports such a requirement in the future.

- **Miscellaneous –**

There are certain pieces of functionality that can be very useful in the production environment. As an example, let's say 1,000 messages have just come into your EAI product, BUT there is a problem: the “plant” in each message needs to be changed from “2300” to “2400”. What do you do? Not that you should ever edit the contents of a message in a middleware product, but under certain “adverse conditions”, you may be forced to. Re-sending the messages may not be an option, so the software should provide some sort of “find and replace” functionality for updating the required data in a specific segment of the message. These little pieces of extra functionality can be very valuable under stressful times.



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- **Many More Objectives to Consider**

The list presented here is long, but even so a list of additional options you might want to consider is probably even much longer than this. Nevertheless, this one gives you a good idea of what type of questions you should be asking EAI vendors out there, to ensure that you are getting the best deal for your money.

3.1.4 Robustness of the Runtime

The application framework debate has been around for quite some time now. The maturity and stability of the underlying framework is not really the striking argument here.

- **Standard J2EE Engine Lack of Stability**

J2EE is the only architecture that has questions surrounding its robustness and stability. But let's face the facts; the majority of integration products out there run on a J2EE engine, so we need to get used to J2EE in our company setup – period! But the question still remains: is it really possible to build a Java application server that never crashes?

- **WebSphere Runtime and ABAP as Positive Examples**

IBM WebSphere has proven its robustness and stability over the years. This has mainly been attributed to the reliable IBM Java transaction engine running beneath it. The SAP ABAP application server followed very much the same path as IBM and based its architecture on “process isolation” from the very beginning. Many may even debate that SAP WebAS has shown greater stability in the productive environment than both Microsoft.NET and J2EE⁴.

- **SAP to Introduce Process Isolation for J2EE**

SAP WebAS is the powerhouse behind all R/3 enterprise systems and has given companies unrivaled stability over the years. SAP has taken a strategic direction to incorporate J2EE into their product suite, and has subsequently invested heavily into ensuring that SAP's J2EE engine implementation becomes as robust as the “tried and tested” ABAP engine. To aid this, SAP announced the “Always on Java initiative”, which set out to create an “unbreakable” Java engine.

Java has always typically followed the “big bang” approach, whereby everything is processed within one virtual machine (VM), and this VM runs inside one process on the OS level. This has the potential to negatively affect all users on a system, should a single user's request fall into error. SAP, however, has decided to take a different approach and has based its Java implementation very much on how it architected the ABAP application server. In ABAP you have a dispatcher and a number of work processes that handle the user requests. The dispatcher ensures that only one user request can be processed by a work process at any one moment in time. If the application the user is busy with crashes, only the current process is affected: all other processes behave as if nothing has happened.

⁴ See “Clash of the Titans Part 3: Why WebAS Beats Microsoft.NET and J2EE” by Axel Angeli, logosworld.com



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Figure 9 depicts how both the ABAP and Java Virtual Machines run within one work process, providing full isolation for the requesting user.

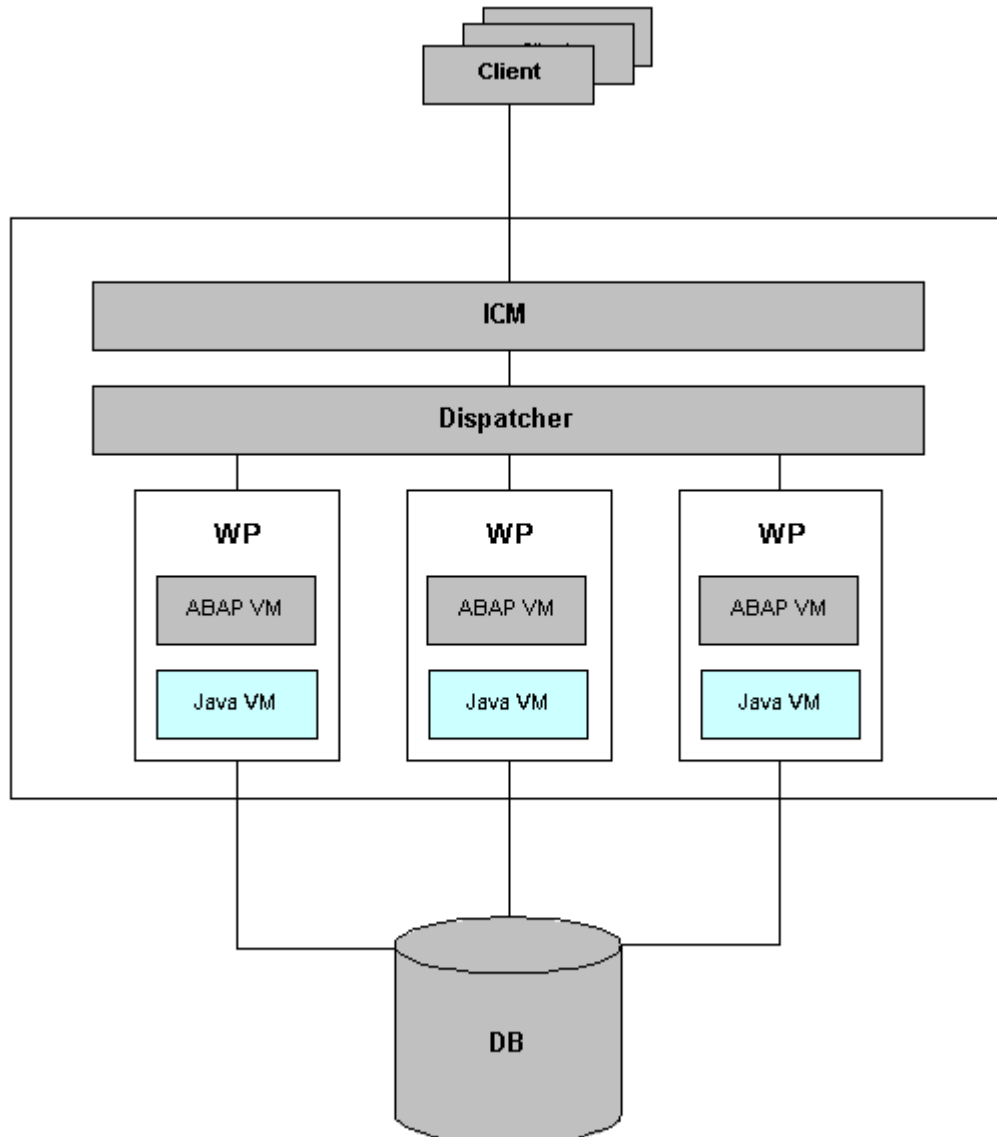


Figure 9: Process Isolation Makes Java VM More Stable

- **NetWeaver Unbreakable Java Will Bring Java Further**

Since most integration products out there run on a J2EE engine, it becomes very important to select a J2EE implementation that is robust enough to last you through the worst weather. SAP's Java implementation looks very promising, and its "Java isolation" concept is a welcomed enhancement. Should you choose an integration product other than SAP XI, make sure that it supports a robust Java implementation like IBM or SAP's version. Seeburger is one such company that has ensured its new "Seeburger AS" (application server) product is fully compatible with running on the new SAP WebAS J2EE implementation. This is great news because you



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know that a company like SAP can't afford to have their J2EE engine crashing, and hence, stability is pretty much ensured.

3.1.5 Artificial Intelligence

Once applications have been integrated and processes orchestrated, processes themselves may become intelligent.

They can:

- Become aware of their role and overall impact within a "bigger picture" process, and may very well understand how they are affecting customers
- Introspect/analyse data to determine the value of the impact
- Automatically send notifications about bad or erroneous data coming through the process
- Learn to predict when problems are likely to occur

For instance, if the process knows one supplier is starting to take longer to respond to "just in time" (JIT) requests, it can notify someone and start giving more requests to alternate suppliers who seem to be doing better.

- **Intelligent Adapters**

Today, most of the adapters out there are "static" in nature, meaning they have no real understanding of the systems or schemas they are connected to. This means that they have been manually coded to both send and receive information, using the sender and receiver schemas. These "static" adapters have no mechanism in place to dynamically change their configuration should the schema change on either side (i.e., an underlying database schema changes, or database table gets more fields added to it).

We are now moving into an era wherein certain adapters need to become more intelligent in nature, so that they are able to "learn" about the environment they are in, and are able to adapt accordingly. Typically an "intelligent" or "dynamic" adapter is able to learn about the systems it is connected to when it is first connected, but more importantly, it continues to adapt itself to a changing environment by "re-synchronizing" with the connected systems, to see if anything has changed. For example an "intelligent" adapter will understand when an invoice number attribute changes, or perhaps it will even wait until an underlying record in a database table becomes "unlocked", before trying to update it.

- **Paper-To-ERP**

The Internet has enabled us to communicate like never before; nevertheless, most transactions still occur via paper and manual operations. This can mostly be seen when dealing with things like invoices and orders. Manual processes are error prone and are often associated with things like:

- Manual data entry errors
- Lost documents, like invoices or orders
- Increased time needed to fulfil a customer request
- Inability to verify the receipt of documents



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- Increased cost and time associated with manual data entry

Any company wishing to continue their competitive advantage, needs an EAI solution that is able to automate many of these manual processes. What we are all looking for is an Artificial intelligence (AI)/Optical Character Recognition (OCR) solution that truly works.

- **Document Image Recognition**

Here we can already think a step further: we would probably not only want to recognize written texts but also scan and interpret drawings and sketches. It is nice to digitize the construction plan of a motor, but it would be nicer if the software could already identify the parts, and put them into the proper inventory.

For an EAI solution to be really valuable, it should provide the functionality to scan an image, capture the data, and then assemble that data into something usable by an application.

- **Radio Frequency Identification (RFID)**

The proper implementation of radio-frequency identification (RFID) solutions can provide significant improvements in the value chain, as well as help provide real-time access to inventories. Bar code readers are very common in warehouse settings today, because they are simple and easy to set up.

Because both bar code and RFID technology are somewhat related, it becomes crucial to understand how the two can compliment each other in the enterprise environment. A distinguishing feature of RFID over bar code technology is that RFID does not require line-of-site interaction between the RFID tags and readers.

It is not very complicated to write software to collect the information sent by a barcode or RFID scanner. What we do need, however, is a standard procedure that comes with the EAI software, which allows us the flexibility to not have to write those programs, drivers, and adapters over and over again. The chances are good that your company already has a functional and working system based on bar codes and business processes that have evolved over the course of many years. The big question remains as to if you should refactor your existing business processes to cater for RFID, or just leave your current bar code solution intact. The aim should not be to replace one solution with another, but more that they should work in “unison” in the future. The EAI integration strategy should reflect this.

- **Supporting Telecommunication Standards Like AS2**

It's never easy for a company to integrate with all their trading partners. Many smaller companies often don't have the economical and technical support to enter into such a collaborative environment. There are many technologies available that would easily allow such collaboration, but unfortunately, most large organizations have not implemented these offerings for their smaller trading partners, and therefore, “inefficiency gaps” still exist in the process chain. The huge amount of new standards and technologies has eliminated previous network limitations, and has given the possibility for a company to integrate with all its trading partners. The less technologically sophisticated your business partners are, the more reason you should look into easier-to-adopt technologies such as HTTP web services, AS2, and even FTP and SMTP. The key challenge is for a company to understand what communications options and protocols are out there, and they need to mix and match these with the right customers and suppliers. We can already say that for smaller companies, SMTP would certainly be the easiest means, but for larger traffic, other options are gaining momentum.



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3.1.6 EAI Orchestration

When one thinks about EAI orchestration, one needs to almost view a situation where you need to “link the dots”. You want a certain set of applications/processes to be interconnected so that a specific outcome can be achieved. The goal these days is not so much to speed up business processes, but rather to ensure that they are flexible enough to rapidly adjust to ever-changing market conditions. It is, however, crucial that there is a clear understanding between “technical process modeling” and “business process modeling”.

Technical process modeling is provided in a tool like SAP XI or Seeburger BIS and allows you to connect processes within applications, in a flexible manner. You would choreograph integration scenarios and processes not only within a company, but also between companies.

Figure 10 depicts a technical workflow/process orchestration using Seeburger BIS.

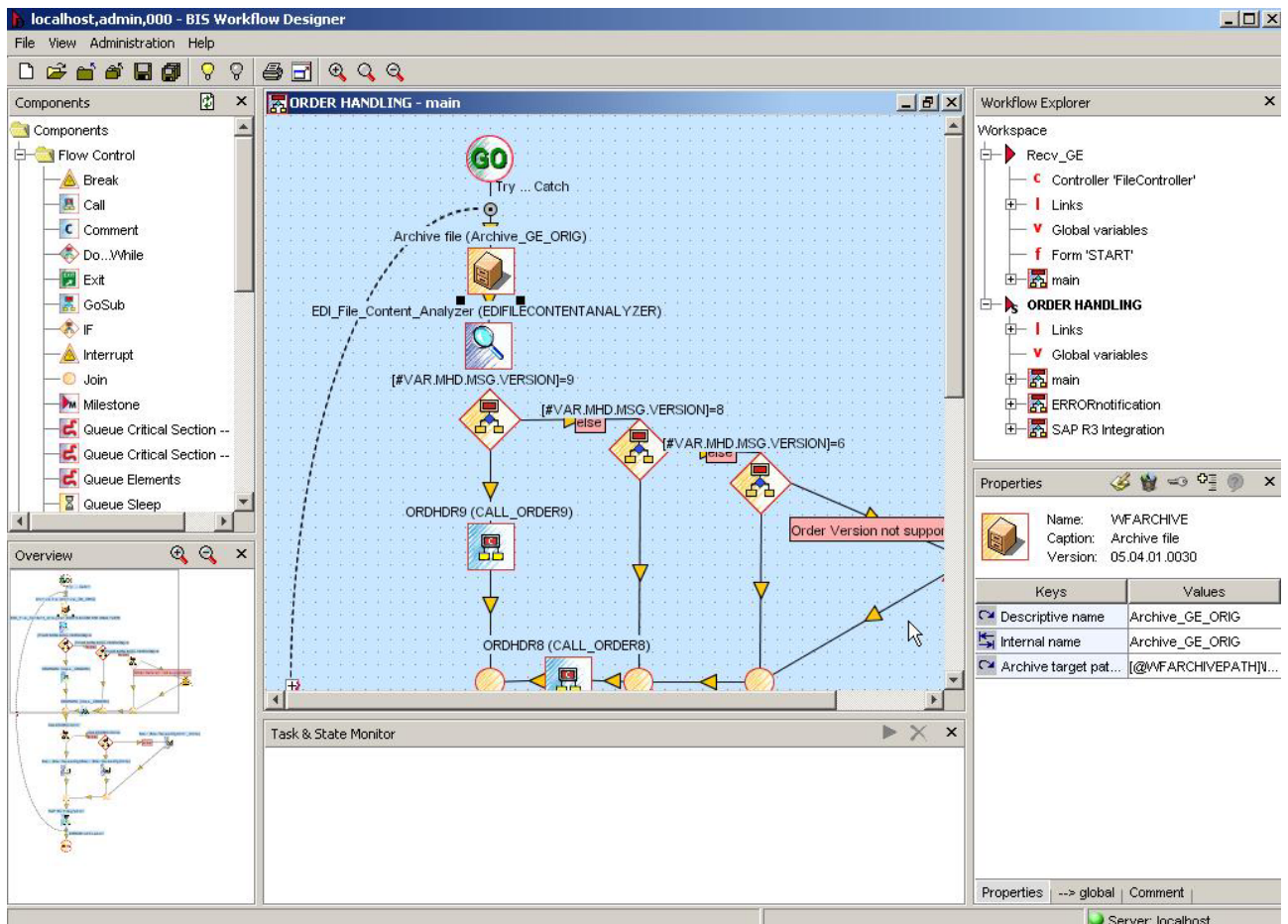


Figure 10: Orchestrating Business Workflows Using Seeburger BIS Workflow Designer

Business process modeling, on the other hand, is modeling at the business level. This is typically accomplished by a product like ARIS, and gives a clear business perspective on the process architecture of a company, ignoring the technical details.



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3.2.5 Side-effects (Safety) Tests

It can't be emphasized enough that your EAI solution will not live in isolation, but will rather live in an ecosystem with other software solutions and products. You really need to follow the entire process to see how the other products in the landscape are affected in adverse conditions. Take an EAI system that communicates directly with SAP. Is there, for example, a mechanism in the EAI solution that provides some sort of thorough "handshaking" between itself and SAP? You want a scenario where, if 10,000 messages are suddenly dumped on the EAI solution, then it "politely" queries SAP, "I have a message, are you able to process it now...Yes...ok, here it is...next message". We don't want a potential scenario whereby the EAI solution can handle the huge volume of messages, but the receiving system cannot.

If the receiving system cannot do a proper handshake, we need to have mechanisms to cope with it. SAP's standard IDoc handler IDOC_INBOUND_ASYNCHRONOUS, for instance, only confirms that the RFC was successful, but not that the message could be stowed away safely for processing. In that case, we need a strategy like a "lazy sending", that allows you to assign a certain (and adjustable) viscosity to the data stream, so that the message can be sent with a delay in between, or in small packages.

3.2.6 Standard Operation Procedures

This is an issue that comes out of daily operation. Does a vendor of a software product have some sort of "Standard Operation Procedure" to react to common incidents, or does the vendor simply wait until something happens and then pull out the guru joker to solve the problem? It is quite clear that a solution cannot handle all the possible problems and scenarios. But there should be a clear procedure for what to do if the worst case happens; know what to do to avoid the worst-case scenario from happening.

3.2.7 What to Do With the Test Results

Following the actual tests, it is necessary to know what was planned to execute, and how to analyze and interpret the test results. You should have a good idea on what is actually "required from the business" and, following that, you can gauge if the test results were acceptable or not. So what do you do if the test results are not satisfactory? Do you follow tradition and buy a bigger box? Sometimes the answer to this is yes, but in some instances you may need to seriously consider running benchmark tests between other EAI solutions to see which one actually has the best performance.

4 Discussing Test Results

In the following text we are going to demonstrate how we applied the testing requirements, and how we discussed the individual issues. The examples given will mainly be taken from the winner of our selection process: "Seeburger Business Integrator". Seeburger suited us best because it works so well within the NetWeaver family and has the option to work both as a stand-alone as well as a plug in to SAP XI.

- **There Is Currently No Outstanding Product**

We need, however, to make one thing clear. It has been the winner for our installation. Like for all EAI applications, it holds true for the EAI orchestration tools as well. There is not one single vendor who can deliver a solution that would fit perfectly with all the different business needs and company infrastructure. Indeed, there is currently not one product that is truly convincing in the sense that it is outstanding, or beats the competitors in most categories. We are still at the beginning, but are in somewhat of a dilemma; we need to decide on something that should hold as a strategic platform for a decade or more. This leads us also to the only "knock-out" criteria that was formulated; the vendor must give believable evidence that their strategy is committed to



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openness, and any future option will be a competitive offer, but all the time not ruling out the use of any product acquired from a third party.

- **Today There Is No General Recommendation**

There have been a couple more orchestration tools under consideration, and test results for them exist. We, however, believe that it does not make much sense in putting them into direct comparison. The reason why a certain product is better or worse than another one, is so dependent on the actual situation, that it would not be fair to point it out under the premises we made.

We are only discussing the sector “Business Integration” here, as it is the most interesting and most competitive spot in the full EAI symphony. Other areas like message queuing are usually already firmly established within a company’s infrastructure, so it is rather a set factor to consider when choosing the remaining elements, than an object to be replaced.

4.1 Author’s Choice: Seeburger Business Integrator

We know that people like to read a recommendation. It is, however, clear that such a decision is very sensitive to the environment of the corporation where the solution will be implanted. So, there won’t be a general recommendation. We needed an example to demonstrate how our selection process came to a conclusion. We have selected Seeburger Business Integrator as our choice for a Business Integrator software to work in combination with an already existing IBM WebSphere/MQ and an SAP-loaded ERP environment. It intrigued us because it showed the best overall performance with respect to:

- Completeness of required features
- Lack of “knock-out” criteria
- Reliability and safety
- Total cost of ownership
- Sustainability of the product

It was typically only due to a higher price, or the presence of an individual knock-out criterion (like lack of a complete suite of EDI message format adapters), that a specific product lost position against Seeburger.

In some cases, like WebSphere or SAP XI, the EDI adapters are third-party developments, plugged into the central engine. In the scenario we had, there was a strong need for EDI (in conjunction with the EAI part); however, there was no need for a high performance and high availability message queuing mechanism, as there was already WebSphere/MQ (without WebSphere Business Integrator[WBI]) in place to guarantee that all message traffic is tracked and secured, so that no messages are ever lost. Based on these performance considerations, we found the “Seeburger Workflow Designer”, monitoring tools, and the better SAP integration make it the best option for an SAP Business Integrator tool.

- **Seeburger Can Snap into NetWeaver**

Another argument from our side was the fact that, from the business end, Seeburger officially partners with SAP to deliver the EDI adapters for SAP XI. Since XI has been a strategic choice in the given context, we also took into account SAP AG’s recommendation to use Seeburger as the adapter engine, in combination with SAP XI.



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Seeburger was asked to put their product “through the trenches”, so to speak, and later give verified feedback of the results. What was nice about our test requirement was that it was focused around how well Seeburger BIS operates under stressful conditions, within an SAP environment. This was to ensure that appropriate “handshaking” was done between Seeburger BIS and SAP at all times to ensure that nothing “falls over” when Seeburger BIS has an enormous strain placed on it. Needless to say, there was absolutely no problem here.

Quite clearly, hardware choice is a very important feature and can influence test results quite dramatically. To prevent other EAI vendors assuming that this is the best Seeburger BIS performs under stressful conditions, we will just say that a “somewhat” powerful server was used and no extra configuration enhancements or “tweaking” were done at all. Seeburger BIS was tested on an absolute “clean” installation.

Typical automotive mappings were thrown into the system (i.e., EDIFACT to invoice IDoc) and were tested in packages of 10, 100, 1,000, and 10,000 messages. Crosscheck indicators and measures were used to get the accurate times spent processing the messages, and results were revealed.

NOTE: The following are only a fraction of the test results presented to us, but should give you an idea on some of the basic test parameters you would want to see in a similar test situation. Once again, the results here are by NO means the maximum capability of Seeburger BIS. It would be able to operate MUCH better in a productive environment with all the “bells and whistles” configured and “tweaked”. When analyzing the results in Figure 11, pay special attention to the SIZE of the messages going through the system.

Workflow	Mapping	File Count	Size of input message in KB	Size of output message in KB	Test Start	Test End	Duration	Files Per second
Receiving Treatment	EDIFACT_to_IDOC_INVOICE	10	10,000	14,000	11:38:43	11:38:45	0:00:02	5
Receiving Treatment	EDIFACT_to_IDOC_INVOICE	100	10,000	14,000	12:31:26	12:31:58	0:00:32	3,125
Receiving Treatment	EDIFACT_to_IDOC_INVOICE	1000	10,000	14,000	12:34:51	12:42:08	0:07:17	2,288
Receiving Treatment	EDIFACT_to_IDOC_INVOICE	10000	10,000	14,000	14:07:10	15:26:03	1:18:53	2,112

Figure 11: Stress Test Results for Converting EDIFACT Messages to IDoc

Figure 12 illustrates some further test results observed when numerous standard “receiving treatment” workflow scenarios were driven through Seeburger BIS (using common EDI mappings). The test clearly shows how the number of files that can be processed per minute is dependant on the size of the incoming file, as well as the specific mapping that is called. Once again, results will vary depending on the chosen hardware and configuration.



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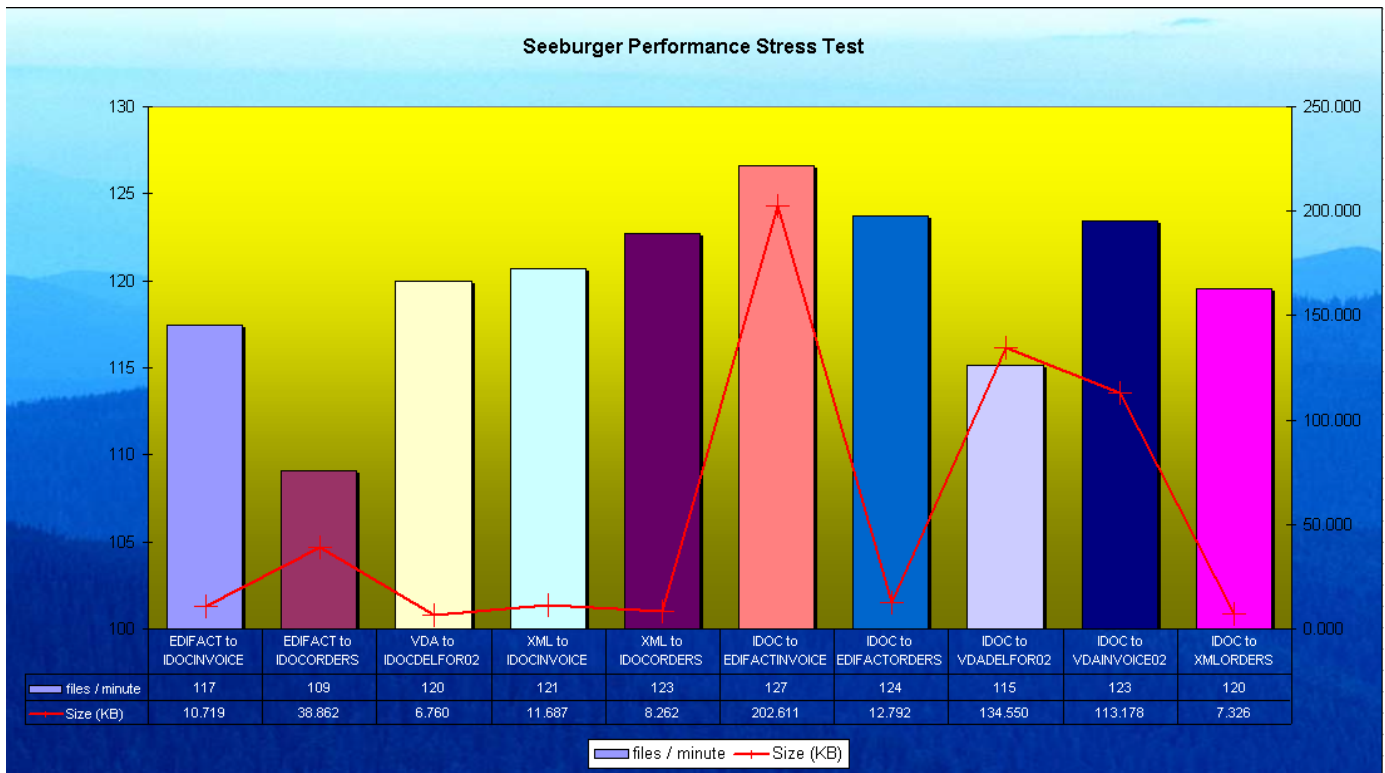


Figure 12: Stress Test Results for Converting Numerous EDI Formats to IDocs

So, it can be said that Seeburger BIS operated extremely well under all the different test scenarios that were thrown at it. The strategic interaction between Seeburger and SAP showed clearly throughout the product evaluation, and it eventually became a “no contest” situation as to what strategic integration product we should choose for our SAP environment.

4.1.3 Useful Business Features

If two or more products play in the same league and seem to be comparable in their basic value, you may want to look at other features they provide as an added value. The most precious offer a product can make is to save time, which is usually equivalent to saving money. In the case of our selection process, we had an eye on the value of the product for use with an EDI-loaded environment.

- **Ready to Use EDI Converters**

Being able to design and change EDI mappings and routings, along with proper triggering and monitoring of subsequent business workflows, had been a focal point in this evaluation.

It is no surprise that Seeburger soon became a favorite for the final choice. Seeburger BIS has strong support of EDI standards and provides a ready-to-use map for nearly any type of data exchange between SAP IDocs and EDI standards (like VDA, ODETTE, EDIFACT, ANSI X.12, etc.). An editor that makes it easy to design new maps, mainly from flat file formats into IDocs (and backwards), is appealing. But, if you are selecting for an organization where EDI plays a minor role, or is handled elsewhere, then pre-selection under this aspect is of no value.



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- **BPEL and ARIS Integration**

Seeburger has had a long-standing, strategic partnership with IDS-Scheer. This is great news for managers who want the ability to integrate process models in a “top down” fashion from a product like ARIS to a product like SAP XI or Seeburger BIS. Seeburger BIS has a “business process engine” that is based on BPEL standards. This enables customers to design and build business processes on ARIS, and then later download them to Seeburger BIS to be executed. This is exactly the same in SAP XI.

- **Paper-to-ERP**

Manual, paper-based processing is still rife in many organizations and often stretches itself throughout the entire supply chain, creating unnecessary bottlenecks throughout the process. The handling of these documents is error prone, time consuming, and most of all, unnecessary. Seeburger’s innovative approach to ensuring “total supply chain integration” has brought about an exciting new “Paper-to-ERP” module that is providing new efficiencies and real-world benefits to an organization. This is most certainly an area that will gather great interest in the years to come, so be sure your solution caters to (or at least has a strategy for) this requirement.

- **SMTP Mail Forms**

When you work with workflow, you will soon realize that the acceptance and compliance depends highly on the way work items are treated. What most people like to see is receiving an email that presents the necessary information, allowing clicking on a possible choice, or filling out some missing information in a form, should this be required. So, it comes in handy that we found a solution within Seeburger that creates the necessary SMTP messages and handles the matching results automatically. So Seeburger comes to the party here (as well) with a solution called “Business Mail”, that combines the high availability of email with the flexibility of XML. It gives smaller suppliers the ability, for example, to process and submit delivery notes, invoices, etc., all via the simple mail interface.

5 Conclusion

The dynamic world is here, and it’s here to stay! The topic of integration has slowly but surely moved its way steadily up the priority list of organizations, as both business and IT people are now getting a better understanding on how it can deliver true value. Once purely looked upon as “just another technology”, integration has now become a strategic priority.

The new service-oriented enterprise (SOA) - or Enterprise Service Architecture (ESA) as SAP names it - has dawned and is set to provide organizations with the platform they require to create on-demand, agile, and cost effective business applications and processes. Companies failing to take advantage of the SOA paradigm will find themselves with multiple integration “silos” as they try to adjust to the dynamic marketplace in years to come.

Probably the most crucial aspect of SOA is the fundamental shift in thinking, for both management and IT. Integration projects, in the future, will be viewed as enterprise-wide strategic activities, rather than “technical initiatives”. “Failing to plan is planning to fail” has never been more true than in today’s integration world. SOA is a strategic journey that will require the continuous approval and support from IT and management. SOA will prove to be one of the key technology providers that give decision makers the ability to continually optimize business processes and be able to quickly discover market opportunities and threats in real-time.

The EAI solution your company chooses will become entrenched within the company integration culture and strategy, and it will be very difficult to replace. For a successful



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integration deployment, you must ensure that your corporate integration strategy, business processes, integration architecture, and stakeholders are all fully unified and talking the same language. Companies failing to pursue one consolidated solution will eventually end up with multiple integration "silos", as they try to adjust to an agile marketplace.

Parts I and II of this series guided you through where we are in integration today, and how to go about changing your mindset for the future. Key aspects to consider were highlighted when analyzing an EAI product. The ability for a company to use the correct blend of technologies and innovative ideas will be the spark that ignites the EAI solution, extending into parts of the supply chain that they never thought possible!

6 After Hours Chat Room

Editor's Note: In this section, our tireless EAI reporters share the results of an online conversation on major EAI points not covered in this article.

Lynton: "Axel, you've been in the EAI game for many years now and have a great mind for separating "hype" from reality. Many large organizations out there have some sort of "business process management" (BPM) strategy in place (albeit often only exercised loosely related to practice using a product like ARIS or Visio). The aim eventually is to have some sort of solid "drill down" capability from "high level" business process models right down to the transaction level workflows in a product like SAP XI or Seeburger. This will give managers a real-time view of the organization. With standards like BPEL showing so much potential and with companies like SAP and IDS-Scheer forming solid "BPM partnerships" do you think we will be able to view processes "end-to-end" in the near future? I mean surely the fact that both SAP XI and Seeburger are fully BPEL compliant is a great sign for integrating into other "higher level" process products like ARIS? Do you think this will provide great value to business?"

Axel: "Those are actually many questions at once. What I can say with certainty is, that BPEL will add great value to business. Simply because it provides something that is the basis of every progress in the history of mankind: BPEL provides for a common and unique language! But one should not ignore that BPEL by itself is only a common language that describes workflows. Currently BPEL is mainly used to tie up external processes. The results are workflows or "meta-transactions"... actually it widens the area that xApps were meant to occupy."

"BPEL will only unfold its true value in combination with BPML, the Business Process Modeling Language. BPML will actually be the first widely accepted language for business ontologies. This will indeed give an end to the time-consuming and fruitless disputes that usually are fed only by different interpretation of terms or an imprecise vision of the actual model used."

"If we manage to use BPEL to design the internal flows of a transaction then we shall have a real breakthrough, mainly in terms of quality and transparency of application development. "

"It has not been decided whether BPEL will be success or not. If the Open Source community won't adopt both BPEL and BPML as their child, it will remain an insular solution. I have always had the picture of ADA in mind. ADA is the programming language that actually has nearly everything that we have today, it is Delphi, Java and ABAP combined in a clever design. But there were never really cheap or at least affordable compilers available. So ADA stayed in a niche and still waits there like the Sleeping Beauty, but no prince will wake her up again."

"The tools that will soon be available to model BPEL and BPML will certainly aid in bringing a better and quicker understanding of business processes. However, this will only work when the tools come free of charge and out of the open source community. If the tools are sold they will reach the elites and some little corner in an enterprise where they produce documentation all day. But the results won't be accepted or even known by the people who actually need to know them:



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the developers and design architects. So, only if the BPEL tools will all be free, then the developers will start designing their work in BPEL first and then start coding it. UML is suffering this fate currently. UML is interesting and Rational Rose is a great product, but who actually uses it? In times of restricted budgets, you'll probably invest it in another RAM memory stick rather."

Lynton: "You've mentioned "dashboards and cockpits" numerous times in the text. Most EAI vendors out there have great technical monitoring for their own products but that seems to be where it ends. What to see as the future for "dashboards and cockpits"? The only way I can really see a company getting exactly what they want is by creating a custom dashboard or cockpit themselves using .NET or something similar? What's your take on the "Business Activity Monitoring" scene and what do you think the future holds in this space?"

Axel: "I think, as always, you carried the answer in your question already. BAM must be agile and highly adaptable to business needs. There are many toolboxes out there that at least are full of nice gadgets and visual gags like graphical instruments, charting aids and statistical formulae. They will at least take away the tedious efforts of having to develop all the "salt and pepper" parts of an application yourself."

"I see the real problem in the applications. Most apps won't actually provide appropriate interfaces for BAM. In mechanical engineering it is good practice that any machinery will provide plugs where one can insert a probe whenever needed. Software applications need such measurement points as well. Could be an area to enhance BPEL or WSDL, just a thought."

Lynton: "There are many great books out there like "Enterprise Integration Patterns" (by Gregor Hohpe and Bobby Woolf) that seem to totally speak on building and deploying "custom written" messaging solutions. They speak of message channels, message routing, and message transformation etc (basically the things that a typical EAI product should provide for). With SOA and the ESB becoming so popular these days do you ever foresee a time when most of the mapping, transformation and routing will be done using re-usable services deployed on the ESB that merely interact with other services in an orchestrated scenario? How should we read into books like "Enterprise Integration Patterns"? Where will applications and patterns like the ones shown in the book fit into the bigger scheme of things?"

Axel: "That is indeed the nature of a pattern: that you can write an abstract framework, a "master template" that describes and implements the pattern. From this master pattern one can derive the instance and give this instance a special flavour."

"The ESA tools are actually the ones that are challenged here to act. 4 out of 5 queue actions can certainly be modeled as an abstract pattern. The ESA market is tough and crowded. Here lies a wonderful market chance: I think, the vendor that comes fully quipped with most important patterns first, will make a big step forward. It is like with SAP. While everyone was selling database engines, SAP decided to deliver what nobody had in the portfolio but every customer needed so badly: content for the database!"

Lynton: "You've been involved in many EAI projects over the years. You seem to be the number one person people call when their EAI projects are failing. What, in your experience, are the main reasons why many EAI projects fail?"

Axel: "Communication. They all lack of communication. Many projects think that EAI (or EDI) can be solved by someone making a design and someone else implementing it. But EAI means that different people, different departments, different companies have to come to a decision. This won't happen if only done via email or some telephone calls. It only works when people sit together very often and discuss all problems in person."



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And we now see the likewise development when we speak of middleware. There are hundreds of middleware programs out there on the market. In my opinion there are all equal: equally poor! They can do more or less well all the basic feature like message storage, mappings and workflow management. But there is hardly anyone that delivers prêt-a-porter solutions for integration brokers. There are many repetitive tasks that have to been developed over and over again in every project, in every company. Think of the “nervous-finger-syndrome”, when someone submits his credit card information through a web site and clicks the submit button several times. You don't want to think of the hassle your accountants have if they need to rollback all the erroneous credit card charges. A good queue can easily implement such a pattern.

And here we see the answer of producing quality with lower budgets and where the future will move to: standard reusable applications written for the ESB. BPEL seem to have the potential to drive this development for the business process design.

And where will IT go? We will reap the benefit of the internet revolution, something that changed our life just like Gutenberg's invention did. The easier corporations can communicate with each other the more the standardization from bottom up (not dictated by organizations like ANSI etc.) will make progress. It will be these companies that cannot react on change – again change happens – who will end up in the defensive. The customer will conquer back his terrain and the vendors that stick to proprietary solutions will disappear. Windows has always been open, the IBM business model has always been based on ISV and SAP learned this lesson, NetWeaver is open. The trend will be to reuse agile components from many different vendors that collaborate.

Lynton: And how will ERP look like in 10 years time?

Axel: Instead of having one heavy ERP monster like R/3, we will have hundreds of small independent components, any little R/3s if you want, that collaborate transparently like people collaborate between offices within a corporation.

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